Air Quality Permitting
Statement of Basis

April 14, 2008

Permit to Construct and Tier II Operating Permit
No. P-2008.0015

Seed Enhancement LLC, dba Summit Seed Coatings, Caldwell

Facility ID No. 027-00090

Prepared by:

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Air Quality Division

PROPOSED FOR PUBLIC COMMENT

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Acronyms, Units, and Chemical Nomenclature

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
Btu	British thermal unit
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	Environmental Protection Agency
gr	grain (1 lb = 7,000 grains)
HAPs	Hazardous Air Pollutants
hp	horsepower
IDAPA	A numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pound per hour
MACT	Maximum Available Control Technology
MMBtu	Million British thermal units
NAAQS	National Ambient Air Quality Standards
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O_3	ozone
PM	Particulate Matter
PM_{10}	Particulate Matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTC/Tier II	permit to construct and Tier II operating permit
PTE	Potential to Emit
Rules	Rules for the Control of Air Pollution in Idaho
scf	standard cubic feet
SIC	Standard Industrial Classification
SIP	State Implementation Plan
Summit	summit Seed Coatings
SM	synthetic minor
SO_2	sulfur dioxide
T/yr	Tons per year
$\mu g/m^3$	micrograms per cubic meter
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01 Sections 201 and 404.04, Rules for the Control of Air Pollution in Idaho (Rules) for Tier II operating permits and Permits to Construct.

2. FACILITY DESCRIPTION

Summit Seed Coatings (Summit) treats seeds such as grass, alfalfa, barley and legumes with mixture of limestone, fungicide, adhesives, peat inoculants, and colorants. The process includes a limestone silos, holding tanks, mixers, a compaction drum, a fluidized bed dryers, screeners, and three baghouses. The three baghouses control the particulate matter emissions from the process. Combustion product emissions from the dryers (CO, NO_x, SO_2, and VOC) are released to the atmosphere uncontrolled.

Raw seeds are purchased by customers and brought to the facility by truck where they are offloaded and treated with the coating material. After packaging, the newly coated seed products are then loaded back onto a truck and shipped to the customer. There is one large warehouse style building at Summit's facility that houses the office, process and storage operations.

3. FACILITY / AREA CLASSIFICATION

Summit is defined as a synthetic minor facility because Summit, without permit limits on the potential to emit, the PM_{10} emissions would exceed 100 tons per year. The AIRS classification is "SM" because the potential to emit of PM_{10} is limited to less than major source levels.

The facility is located within AQCR 64 and UTM zone 11. The facility is located in Canyon County which is designated as attainment or unclassifiable for all criteria air pollutants (i.e., PM_{10}, CO, NO_X, SO_2, lead, and ozone).

The AIRS information provided in Appendix A defines the classification for each regulated air pollutant at Summit. This required information is entered into the EPA AIRS database.

4. APPLICATION SCOPE

The facility requested to modify Tier II Operating Permit and Permit to Construct No. T2-030054, issued July 12, 2004. This permitting action is for adding a new Seed Coating Line No. 2 to the facility. Also, the facility is replacing the existing natural gas 91 gallons hot water boiler with a new natural gas 9.5 horsepower (hp) hot water boiler.

4.1 Application Chronology

2/15/2008	A 15-day Pre-PTC application was received.
2/28/2008	A 15-day Permit Construction approval letter was sent to Summit.
3/14/2008	The PTC application was determined complete.
3/19/2008	DEQ received supplemental information from Summit.

5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this permit to construct and Tier II operating permit (PTC/Tier II).

5.1 Equipment Listing

Table 5.1 contains the proposed and existing process equipment at summit.

Table 5.1. PROCESS EQUIPMENT AT SUMMIT SEED COATINGS

Equipment	Capacity	Manufacturer	Model or Serial #
Limestone silo 1	50 tons	NA	NA
Limestone silo 2	50 tons; 12 inch diameter, 2178 cubic feet	Wheatland	1215-55
Limestone/gypsum receiver tank	NA	NA	NA
Seed tank	NA	NA	NA
Seed mixer	NA	NA	NA
Compaction drum	NA	NA	NA
Fluidized bed burner for seed coating line no. 1	5 MMBtu/hr[a], natural gas	Chief	H400-100-NGEM PNTD-02E1
Fluidized bed dryer for seed coating line No. 2	8.0 MMBtu/hr, natural gas	Oliver	G91-200
Hot water boiler – 9.5 Hp	0.398 MM Btu/hr (1,000 lbs steam/hr), natural gas	Parker Industrial Boiler	41030
North and south baghouses for seed coating Line no. 1	--	Southern Felt Company, Inc.	934-1-1, Polyester Southern Felt Pural NF
Carbotech baghouse for seed coating Line no.2	--	Carbo-Tech with a flow rate of 75,000 cubic feet per minute	Model: 39-15-13-11945
Eight space heaters	0.2 MMBtu/hr, natural gas	Dayton Electric and Fraser Johnson	3E844; 3E845;2004HPN; 2004HPN;2004HPN; 2004HPN; 3E850;3E851
Office furnace	0.2 MMBtu/hr, natural gas	Carrier Corporation	58ST-A070-12
Final product screener for line 1	NA	NA	NA
Super Screen for line 2	NA	BM&M	C3-600 Universal
Bag off tank for line 1	NA	NA	NA
Bag off tank for line 2	NA	Fischbein 400	TE-100
One pressure washer	0.325 MMBtu/hr, No.2 fuel oil	Ramtec	Rt-AV-500-4

MMBtu/hr = million British thermal units per hour
NA = not available

5.2 Emissions Inventory

Emissions estimates of criteria air pollutants and toxic air pollutants (TAPs) were provided by JBR Environmental Consultants on behalf of Summit. Table 5.2 summarizes the criteria air pollutants from the facility and represents the potential emissions. The TAPs emissions estimates are included in Appendix B of this statement of basis. The emission calculations submitted in the application were checked by DEQ for the bases of the emissions factors and references and found to be consistent with current DEQ emissions estimations methodology. Therefore, DEQ used the applicant emissions estimates as a basis for the permitting analyses (i.e., modeling, compliance with NAAQS, TAPs increment analysis, and processing fees assessment) for this permitting action.

For the PM_{10} emissions estimates from the Carbotech baghouse stack, emissions were based on the actual grain loading of the filter bags of the baghouse, which is 0.0001153 gr/dscf (grains per dry standard cubic foot). The grain loading is guaranteed by the bags manufacturer (Southern Felt Company).

The maximum actual air flow rate through the baghouse is 75,000 acfm. The calculated dry standard air flow rate is 63,052 dscfm. Thus, by using the dry standard air flow rate of 63,052 dscfm and the grain loading of 0.0001153 gr/dscf results in a PM_{10} emissions rate equal to 0.062 lb/hr (63,052 dscfm * 0.0001153 gr/dscf * 60 min./1 hr * 1 lb/7,000 gr). For conservatism, the permittee used the actual flow rate for the PM_{10} emissions estimates from the baghouse.

The grain loading documentation is located in Appendix B of this document and is based on emission test results utilizing ASTM D6830-02 Standard Test Method. This test method determines the performance of the filter media and the results can be used for design and selection of filter media. To provide flexibility for Summit to use filter bags provided by different manufacturers, Summit requested in the PTC application a grain loading limits that is slightly higher than these test results provided by Southern Felt Company. Therefore, a grain loading limit of 0.00073 gr/dscf is included in the permit as a limit for PM_{10} emissions from the Carbotech baghouse stack. This grain loading limit will result in PM_{10} emissions equal to 0.469 lb/hr (75,000 acfm * 0.00073 * 60 min/ 1 hr * 1 lb/7,000 gr) and 2.06 T/yr.

The permittee modeled the PM_{10} emissions at rate of 0.528 lb/hr, which is higher than that estimated PM_{10} due to the grain loading limit of 0.00073 gr/dscf and demonstrated compliance with NAAQS.

Please refer to Appendix B of this statement of basis which contains all emissions calculations for all the criteria and toxic air pollutants and the Carbotech's grain loading guaranteed as submitted by the company.

It should be noted that the increase in criteria air pollutants emissions from adding the line No. 2 to the facility were increased by 8.99 T/yr. The increase in the criteria air pollutants and the TAPs emissions were used to determine the processing fees assessed in accordance with IDAPA 58.01.01.226.

Table 5.2. SUMMARY OF EMISSIONS INVENTORY

Summit Seed Coatings, Caldwell Potential Emissions[a] – Hourly (lb/hr), and Annual (T/yr)												
Point Source Description	**PM_{10}**		**NO_x**		**CO**		**VOC**		**SO_2**		**Lead**	
	lb/hr	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
New hot water boiler	0.0029	0.0127	0.038	0.168	0.032	0.141	0.0021	0.0092	0.00023	0.00101	1.9E-07	8.4E-07
Four-stage fluidized bed dryer for line no. 2- natural gas	0.0585	0.2561	0.769	3.369	0.646	2.83	0.0423	0.1853	0.0046	0.0202	3.8E-06	1.7E-05
8 space heaters – natural gas	0.012	0.05	0.16	0.68	0.13	0.57	0.009	0.038	0.0009	0.004	7.8E-07	3.4E-06
Office furnace	0.001	0.01	0.02	0.09	0.02	0.07	0.001	0.005	0.0001	0.001	9.7E-08	4.3E-07
Fluidized bed burner for line No. 1- natural gas	0.04	0.16	0.49	2.13	0.41	1.79	0.03	0.12	0.003	0.01	2.4E-06	1.1E-05
Pressure washer – No. 2 - diesel fuel	0.10	0.10	1.43	1.43	0.31	0.31	0.117	0.12	0.09	0.09	0.0E+00	0.0E+00
Propane tank	--	--	--	--	--	--	0.030	0.130	--	--	--	--
Total point sources	0.214	0.59	2.91	7.87	1.54	5.71	0.231	0.608	0.099	0.13	3.32E-06	1.45E-05
Particulate Emissions from the Baghouses[b]												
Carbotech baghouse	0.469	2.06										
South baghouse	0.023	0.1										
North baghouse	0.023	0.1										
Total baghouse emissions	0.515	2.26										
TOTAL FACILITY-WIDE EMISSIONS	0.729	2.85										

[a] As determined by a pollutant-specific EPA reference method, DEQ-approved alternative, or as determined by DEQ's emissions estimation methods used in this permit analysis.

[b] Based on a baghouse control efficiency of 99.99% for PM_{10} for the north and south baghouses. For the Carbotech baghouse it is assumed the baghouse control efficiency for PM_{10} is 99.9% (worst case).

As it is indicated in Table 5.2, the emissions of any criteria air pollutants that resulted from the modification of the facility did not trigger the major source threshold of 100 T/yr. Thus, emissions from Summit are below the permitting requirements that are mandated under TV permitting program.

In addition, potential emissions of any single HAP were estimated to be less than 10 T/yr. Potential emissions for two HAPs or more were estimated to be below the major source threshold of 25 T/yr for a combination of two HAPs or more – refer to Appendix B.

5.3 Modeling

The permittee supplied the National Air Quality Standards (NAAQS) for the criteria air pollutants and TAPs ambient impact demonstration in support of the PTC application. The DEQ's modeling memorandum concerning the review of the ambient impact demonstration is included in Appendix C of this document. The results show that Summit has demonstrated compliance with NAAQS and with IDAPA 58.01.01.585 and 586 to the satisfaction of DEQ.

The results for the criteria air pollutants full impact analyses and the TAPs impact analyses are included in tables 5.3 and 5.4.

Table 5.3 RESULTS OF FULL IMPACT ANALYSES

Pollutant	Averaging Period	Modeled Design Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Ambient Impact ($\mu g/m^3$)	NAAQS[b] ($\mu g/m^3$)	Percent of NAAQS
PM_{10}[c]	24-hour	9.1[e] (7.5)[f]	94	103.1	150	68.7%
	Annual	3.2	30	33.2	50	66.4%
NO_2[d]	Annual	27.2	32	59.2	100	59.2%

[a] Micrograms per cubic meter
[b] National ambient air quality standards
[c] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[d] Nitrogen dioxide
[e] Highest 2nd high value
[f] Highest 6th high value for the modeling run using a concatenated 5-year meteorological data file

Table 5.4. RESULTS OF TAPs ANALYSES

Carcinogenic TAP	Averaging Period	Maximum Modeled Concentration (ug/m^3)[a]	AAC/AACC[b] (ug/m^3)	Percent of AAC/AACC
Arsenic	Annual	1E-05	2.3E-04	4.3%
Cadmium	Annual	4E-05	5.6E-04	7.1%
Formaldehyde	Annual	2.23E-03 (2.7E-03)[c]	7.7E-02	2.9% (3.5%)[c]
Thiram	24-hour	13.0	250	5.2%

[a.] Micrograms per cubic meter
[b] Acceptable ambient concentration for non-carcinogens/acceptable ambient concentration for carcinogens
[c] Maximum impact obtained from the modeling output file submitted by SSC and corresponding percentage of increment

5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC/T2.

IDAPA 58.01.01.201.....Permit to Construct Required

The facility's proposed project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules. Therefore, a PTC is required.

IDAPA 58.01.01.300, 40 CFR Part 70....Title V Classification

Not applicable. Emissions of any regulated air pollutants are below any regulatory requirements for Title V.

40 CFR 52.21 .....PSD Classification

The facility is not subject to PSD requirements because the emissions increases are less than significant.

40 CFR 60 .....NSPS applicability

Summit is not subject to New Source Performance Standards because the boiler is less than 10 MMBtu/hr.

40 CFR 61 .....NESHAP Applicability

Summit is not subject to National Emissions Standard for Hazardous Air Pollutants.

40 CFR 63 .....MACT Applicability

Summit is not subject to any Maximum Achievable Control Technology standards.

40 CFR 64 .....CAM Applicability

Summit is not subject to Compliance Assurance Monitoring because it is not at a Title V facility.

5.5 Fee Review

Table 5.5 lists the processing fee associated with this permitting action. The facility is subject to a processing fee of $2,500.00 because its permitted emissions are 8.99 T/yr.

Table 5.5 PTC PROCESSING FEE

Emissions Inventory			
Pollutant	**Annual Emissions Increase (T/yr)**	**Annual Emissions Reduction (T/yr)[1]**	**Annual Emissions Change (T/yr)**
NO_X	3.54	0.008	3.53
SO_2	0.02	0.00005	0.02
CO	2.97	0.007	2.96
PM_{10}	2.33	0.0006	2.33
VOC	0.19	0.038	0.15
HAPs/TAPs[2]	--	--	--
Total:	9.05	0.054	**8.99**

[1] The reduction is due to the removal from the facility the 91 gallon hot water boiler operated on natural gas
[2] The HAPs and TAPs are accounted for in PM_{10} and VOC

6. PERMIT CONDITIONS

This section summarizes only the changes made to the existing Tier II operating permit and permit to construct as a result of adding the new seed coatings line no. 2 to the facility.

6.1 Revised Emission Unit Name Change

The name of South Baghouse and North Baghouse emissions points existed in Summit's Tier II Operating Permit and Permit to Construct No.T2-030054, issued July 12, 2004 are now changed for the modified PTC/T2 to read as follows: Seed Coating Line No. 1. Emissions from the Seed Coating Line No. 1 are the same as existed in the facility's permit issued July 12, 2004 permit.

6.2 Permit Condition 4.3 sets PM_{10} emissions limits from the baghouse stack of Seed Coating Line No. 2. The PM_{10} emissions limits are based on the Carbotech baghouse grain loading, which is limited to 0.00073 grains per dry standard cubic feet. This grain loading limits is conservative compared with the actual grain loading for the polyester filter bags, which have a grain loading of 0.0001153 gr/dscf (based on ASTM D6830-02 Test Method for PM_{10}). Summit conservatively requested and assumed a higher grain loading to account for the actual operating conditions that may differ from the test condition. This will allow the company the flexibility to use filter bags that are provided by different manufacturer, which may not be able to provide a grain loading guarantee that is equal to 0.0001153 gr/dscf. Compliance with this permit condition is set through Permit Conditions 4.5, 4.7, and 4.8.

Permit Condition 4.5 requires that the permittee to install bags in the baghouse that are made by Polyester Southern Felt Pural NF or equivalent.

Permit Condition 4.7 requires the permittee to develop an O&M manual that shall describe the procedures that will be followed to comply with General Provision 2 and the manufacturer warranty specifications for the Carbotech baghouse. The manual shall contain, at a minimum, requirements for quarterly inspections of the baghouse. The inspections shall include, but not limited to, checking the bags for structural integrity and that they are appropriately secured in place.

Baghouses are expected to be highly effective in controlling particulate matter emissions from seed handling facilities provided they are operated and maintained according to manufacturer specifications and periodically inspected.

Permit Condition 4.8 requires maintaining records of the quarterly inspections of the Carbotech baghouse. It also requires the facility to maintain on site manufacturer warranty on the particulate matter grain loading emissions rate from the Carbotech baghouse that control emissions from the seed coating line No.2. The modeled emission estimates were made assuming emissions from the baghouse do not exceed 0.00073 gr/dscf.

6.3 Permit Condition 4.4 sets opacity limit from the Carbotech baghouse stack to 20% opacity in accordance with IDAPA 58.01.01.625. Compliance with this permit condition is determined through Permit Condition 2.8.

6.4 Permit Condition 4.6 requires the permittee to operate the fluidized bed dryer by using natural gas fuel exclusively. Compliance with this permit condition is in accordance with General Provision 7.

7. PERMIT REVIEW

7.1 Regional Review of Draft Permit

Boise Regional Office was provided with a draft of the permit for review on March 21, 2008. No comments were received.

7.2 Facility Review of Draft Permit

Summit was provided with a draft of the permit for review on April 3, 2008. No comments were received.

7.3 Public Comment

An opportunity for public comment period on the PTC/Tier II application was provided from February 26, 2008 to March 11, 2008 in accordance with IDAPA 58.01.01.209.01.c. During this time, DEQ received a request from Idaho Conservation League to provide the permit for public comment. Therefore, DEQ will provide the permit for public comment.

APPENDIX A – AIRS INFORMATION

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

Facility Name: Seed Enhancements LLC, dba Summit Seed Coatings
Facility Location: Caldwell
AIRS Number: 027-00090

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO_2	B							U
NO_x	B							U
CO	B							U
PM_{10}	SM							U
PT (Particulate)	SM							
VOC	B							U
THAP (Total HAPs)	B							
			APPLICABLE SUBPART					

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)
[b] AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, **or** each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

APPENDIX B – Emissions Inventory

APPENDIX C – Modeling Review

M E M O R A N D U M

DATE: March 18, 2008

TO: Harbi Elshafei, Permit Writer, Air Program

FROM: Darrin Mehr, Air Quality Analyst, Air Program

PROJECT NUMBER: P-2008.0015

SUBJECT: Modeling Demonstration for Summit Seed Coatings, 15-Day Pre-Permit to Construct for a Modification to Their Facility in Caldwell, Idaho.

1.0 SUMMARY

Summit Seed Coatings (SSC) submitted an application for a 15-Day Pre-Permit to Construct on January 15, 2008. This 15-day pre-permit application was denied on January 25, 2008, under project number P-2008.0006.

SSC submitted an amended application on February 15, 2008. This project was assigned project number P-2008.0015.

SSC is an existing facility, with a facility-wide Tier II/PTC issued on July 12, 2004. This proposed project will add one new seed coating production line, which will consist of:

- a baghouse,
- a four-stage fluidized bed dryer (combined capacity of natural gas-fired burners is 8.0 million Btu/hr),
- a limestone storage silo, and,
- a 9.5 horsepower natural gas-fired boiler (replacement unit for the existing 91 gallon hot water boiler).

IDAPA 58.01.01.203.02 requires the facility to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). IDAPA 58.01.01.210 requires the facility to demonstrate compliance with the toxic air pollutants (TAPs) increments, which are listed in IDAPA 58.01.01.585 and 586.

JBR Environmental Consultants, Inc. (JBR) performed the ambient air dispersion modeling demonstration for this project on behalf of SSC. The modeling analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. DEQ did not re-run the modeling files for this project. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
PM_{10} Emission Controls PM_{10} emissions for the new process line were proposed to be controlled by a baghouse. Compliance with the PM_{10} NAAQS were demonstrated using emission rates corresponding to a level of control of a baghouse.	PM_{10} ambient impacts were evaluated using an effective level of control. Regardless of whether the baghouse is viewed as air pollution control equipment or process equipment, the permit should contain requirements to install and effectively operate the proposed baghouse.
The existing hot water boiler regulated in the facility's PTC/Tier II permit was not included in the modeling demonstration for this project.	The existing boiler was proposed to be replaced by a new natural gas-fired 9.5 horsepower hot water boiler. Operation of the existing boiler was not accounted for in the modeling demonstration and concurrent operation of the boilers should not be allowed in the modified permit.
The pressure washer (PRESWASH) was modeled for 6 hours per day, and 365 days per year, for a total of 2,190 hours per year.	The application requests 2,000 hours per year of operation. Predicted facility-wide ambient impacts are not close to the standards for daily PM_{10} and annual PM_{10} and NO_2 NAAQS. Permit limitations in the forms of emission rate limits or operating limits are not recommended for the limited operation of the pressure washer, based on the margins of compliance.

2.0 BACKGROUND INFORMATION

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The SSC facility is located in Canyon County, designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}).

There are no Class I areas within 10 kilometers of the facility.

2.1.2 Significant and Full Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources at the facility exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.120, then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. CRITERIA AIR POLLUTANTS APPLICABLE REGULATORY LIMITS				
POLLUTANT	**Averaging Period**	**Significant Contribution Levels[a] ($\mu g/m^3$)[b]**	**Regulatory Limit [c] ($\mu g/m^3$)**	**Modeled Value Used[d]**
PM_{10}[e]	Annual	1.0	50[f]	Maximum 1st highest[g]
	24-hour	5.0	150[h]	Maximum 6th highest[i]
Carbon monoxide (CO)	8-hour	500	10,000[j]	Maximum 2nd highest[g]
	1-hour	2,000	40,000[j]	Maximum 2nd highest[g]
Sulfur Dioxide (SO_2)	Annual	1.0	80[f]	Maximum 1st highest[g]
	24-hour	5	365[j]	Maximum 2nd highest[g]
	3-hour	25	1,300[j]	Maximum 2nd highest[g]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1st highest[g]
Lead (Pb)	Quarterly	NA	1.5[h]	Maximum 1st highest[g]

[a.] IDAPA 58.01.01.006.102
[b.] Micrograms per cubic meter
[c.] IDAPA 58.01.01.577 for criteria pollutants
[d.] The maximum 1st highest modeled value is always used for significant impact analysis
[e.] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f.] Never expected to be exceeded in any calendar year
[g.] Concentration at any modeled receptor
[h.] Never expected to be exceeded more than once in any calendar year
[i.] Concentration at any modeled receptor when using five years of meteorological data
[j.] Not to be exceeded more than once per year

New source review requirements for assuring compliance with $PM_{2.5}$ standards have not yet been developed. EPA has asserted through a policy memorandum that compliance with $PM_{2.5}$ standards will be assured through an air quality analysis for the corresponding PM_{10} standard. Although the PM_{10} annual standard was revoked in 2006, compliance with the revoked PM_{10} annual standard must be demonstrated as a surrogate to the annual $PM_{2.5}$ standard.

2.1.3 TAPs Analyses

The increase in emissions from the proposed project are required to demonstrate compliance with the toxic air pollutant (TAP) increments, with an ambient impact dispersion analysis for any TAP with a requested potential emission rate that exceeds the screening emission rate limit (EL) specified by IDAPA 58.01.01.585 or 58.01.01.586.

This project is for a modification to an existing facility that was originally constructed in 2002, and issued a combination PTC/Tier II operating permit on July 12, 2004. The analyses submitted in this application included a project-specific TAPs compliance demonstration per the requirements of IDAPA 58.01.01.210.

2.2 Background Concentrations

Ambient background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. The NO_2 background concentration for this site was based on the default small town/suburban background value.

The PM_{10} and NO_2 ambient background values are reasonably conservative. Due to the relatively low predicted ambient impacts presented in SSC's modeling demonstration, these background concentrations are adequate for this project. Use of extremely conservative background concentrations would not affect the compliance status and the permit requirement recommendations. Background values are listed in Table 3.

Table 3. BACKGROUND CONCENTRATIONS		
Pollutant	**Averaging Period**	**Background Concentration ($\mu g/m^3$)[a]**
PM_{10}[b]	24-hour	94
	Annual	30

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

NO_2[c]	Annual	32

[a.] Micrograms per cubic meter
[b.] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[c.] Nitrogen dioxide

3.0 MODELING IMPACT ASSESSMENT

3.1 Modeling Methodology

Table 4 provides a summary of the modeling parameters used in the submitted modeling analyses.

Table 4. MODELING PARAMETERS

Parameter	*Description/ Values*	*Documentation/Additional Description*
Model	AERMOD	AERMOD, Version 07026
Meteorological data	Boise Airport 1988-1992	Boise surface and upper air data were used for these analyses. This met data set contains surface land use coefficients established by DEQ to reflect the area surrounding the Boise airport met data collection site. The surface and upper air data was processed by DEQ in AERMET, and the model-ready data was provided to JBR Environmental Consultants (JBR). The surface characteristic values were not changed by JBR.
Land Use (urban or rural)	Rural	Urban heat rise coefficients were not used. DEQ verified that greater than 50% of the land surrounding the proposed site consists of low-level residential buildings and agricultural land. The appropriate land use designation is rural.
Terrain	Considered	Receptor 3-dimensional coordinates were obtained from USGS DEM files and used to establish elevation of ground level receptors. Base elevations of buildings and sources were not re-generated from the DEM file by DEQ.
Building downwash	Downwash algorithm	Building dimensions obtained from the submitted facility plot plan. BPIP-PRIME and AERMOD, which contains the PRIME algorithm, were used to evaluate downwash effects.
Receptor grid	Grid 1	Approximately 25-meter spacing along facility property boundary
	Grid 2	Approximately 50-meter spacing extending 200 meters outward in a grid centered on the facility
	Grid 3	100-meter spacing extending 300 meters outward in a grid centered on the facility and Grid 2
	Grid 4	250-meter spacing extending 1000 meters outward in a grid centered on the facility and Grid 3
	Grid 5	500-meter spacing extending 2,500 meters outward in a grid centered on the facility and Grid 4

3.1.1 Modeling protocol

A modeling protocol was submitted to DEQ by JBR, on behalf of SSC, on November 28, 2007, prior to submission of the 15-day PTC application. The modeling protocol was approved, with comments, by DEQ on October 18, 2007. Modeling was conducted using methods documented in the modeling protocol and the *State of Idaho Air Quality Modeling Guideline*.

3.1.2 Model Selection

AERMOD was used by SSC to conduct the ambient air analyses. AERMOD is the recommended model for this project. Building-induced downwash effects are of concern for this project because ambient air receptors are located within structure recirculation cavities. The PRIME algorithms in AERMOD and BPIP-PRIME calculate ambient impacts influenced by building wake effects within recirculation cavities.

3.1.3 Meteorological Data

Boise airport meteorological station surface and upper air meteorological data from 1988 to 1992 was used for the site in Caldwell, Idaho. DEQ provided the met data for this project and JBR/SSC used the same site characteristic values for albedo, surface roughness, and Bowen ratio in developing the air pollutant dispersion analyses.

3.1.4 Terrain Effects

The modeling analyses conducted by SSC considered elevated terrain. AERMAP was used by SSC to determine the actual elevation of each receptor using United Geological Survey (USGS) digital elevation map (DEM) files for the area surrounding the facility. Elevations of emission sources, buildings, and receptors were developed based on surrounding terrain elevations from the DEM files.

3.1.5 Facility Layout

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the scaled plot plan submitted with the application to the modeling files and satellite images of the site on the Google Earth internet website. JBR and SSC revised the modeling input files to include the nearby Rotomoulding structure. Rotomoulding and SSC share a common fence which surrounds the property of both facilities.

3.1.6 Building Downwash

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analyses. The Building Profile Input Program (BPIP) with the Plume Rise Model Enhancements (PRIME) algorithm was used by the applicant to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters for AERMOD for building-induced downwash effects.

3.1.7 Ambient Air Boundary

Ambient air was determined to exist for all areas immediately exterior to the facility's fenced property boundary on the south, east, and west sides of the facility. SSC shares a common fence with the Rotomoulding facility, which is located just north of SSC. The property boundary between Rotomoulding and SSC is not fenced. SSC provided photographs and a description of the no trespassing signs that control access on SSC's property by Rotomoulder's employees and visitors. The property boundary is established as the ambient air boundary according to the methods specified in the *State of Idaho Air Quality Modeling Guideline*.

3.1.8 Receptor Network

The receptor grids used by SSC met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. DEQ determined that the receptor grid was adequate to reasonably resolve the maximum modeled ambient impacts.

3.2 Emission Rates

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application. The following approach was used for DEQ modeling:

- All modeled criteria air pollutant and TAP emissions rates were equal to or greater than the facility's emissions calculated in the PTC application or requested permit allowable emission rates.

The short-term emission rates listed in Table 5 were modeled for 24 hours per day, except for source PRESWASH (pressure washer), which was modeled for 6 hours per day for operating hours 8 AM to 10 AM, and 12 PM to 2 PM, and 3 PM to 5 PM.

Table 5. MODELED CRITERIA SHORT-TERM EMISSIONS RATES

Source ID	Description	Emission Rates (lb/hr[a])
		PM_{10}[b]
SH1	Space Heater 1 (existing)	0.0015
SH2	Space Heater 2 (existing)	0.0015
SH3	Space Heater 3 (existing)	0.0015
SH4	Space Heater 4 (existing)	0.0015
SH5	Space Heater 5 (existing)	0.0015
SH6	Space Heater 6 (existing)	0.0015
SH7	Space Heater 7 (existing)	0.0015
SH8	Space Heater 8 (existing)	0.0015
OFFFURN	Office Furnace (existing)	0.0015
NHWB	New Hot Water Boiler (new)	0.003
PRESWASH	Pressure Washer (existing)	0.101
BH1	Baghouse 1 (existing)	0.019
BH2	Baghouse 2 (existing)	0.019
BH3	Baghouse 3 (new)	0.528

[a.] Pounds per hour
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers[d]

All sources were modeled as operating continuously for 8,760 hours per year, except the pressure washer. The pressure washer was modeled for 6 hours per day for 365 days per year, for a total of 2,190 hours per year, at the emission rates listed in Tables 5 and 6. Emissions of SO_2, CO, and lead were not modeled by SSC because emissions attributed to this modification project were below modeling thresholds.

Table 6. MODELED CRITERIA ANNUAL EMISSIONS RATES

Source ID	Description	Emission Rates (lb/hr[a])	
		PM_{10}[b]	NO_x[c]
SH1	Space Heater 1 (existing)	0.0015	0.0195
SH2	Space Heater 2 (existing)	0.0015	0.0195
SH3	Space Heater 3 (existing)	0.0015	0.0195
SH4	Space Heater 4 (existing)	0.0015	0.0195
SH5	Space Heater 5 (existing)	0.0015	0.0195
SH6	Space Heater 6 (existing)	0.0015	0.0195
SH7	Space Heater 7 (existing)	0.0015	0.0195
SH8	Space Heater 8 (existing)	0.0015	0.0195
OFFFURN	Office Furnace (existing)	0.0015	0.0195
NHWB	New Hot Water Boiler (new)	0.003	0.039
PRESWASH	Pressure Washer (existing)	0.101	1.433
BH1	Baghouse 1 (existing)	0.019	0.243
BH2	Baghouse 2 (existing)	0.019	0.243
BH3	Baghouse 3 (new)	0.528	0.769

[a.] Pounds per hour
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[c.] Nitrogen oxides

The toxic air pollutant (TAP) emission rates listed below in Table 7 were modeled for 24 hours per day and 8,760 hours per year to determine compliance with the applicable TAP increments.

Table 7. MODELED TOXIC AIR POLLUTANTS EMISSIONS RATES					
Source ID	**Description**	**Carcinogenic TAPs**			**Non-carcinogenic TAPs**
		Arsenic (lb/hr)[a]	**Cadmium (lb/hr)**	**Formaldehyde (lb/hr)**	**Thiram (lb/hr)**
NHWB	New Hot Water Boiler	7.70E-08	4.29E-07	2.87E-05	0.0
BH3	Baghouse 3	1.54E-06	8.46E-06	5.77E-04	1.22

[a.] Pounds per hour

3. 3 Emission Release Parameters

Table 8 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for point sources. Documentation on the release parameters indicated that the data for proposed Baghouse 3 and the associated blower system that was used in the modeling demonstration was obtained from the design specifications provided by Carbo-Tech Group, Inc. Baghouses 1 and 2 (BH1, BH2) were modeled with a high exhaust velocity value of 39.15 meters per second. These are existing emission points, and no additional documentation on the exhaust parameters was provided for these sources. DEQ performed a sensitivity analysis on the exhaust velocities for these emission points. See Section 3.5 below. Other values used in the analyses appeared reasonable and within expected ranges for the assumptions used in the submitted analyses.

Table 8. POINT SOURCE STACK PARAMETERS					
Release Point	**Description**	**Stack Height (m)[a]**	**Modeled Stack Diameter (m)**	**Stack Gas Flow Temperature (K)[b]**	**Stack Gas Flow Velocity (m/sec)[c]**
SH1	Space Heater 1 (existing)	7.32	0.203	449.85	0.001[e]
SH2	Space Heater 2 (existing)	7.32	0.203	449.85	0.001[e]
SH3	Space Heater 3 (existing)	7.32	0.203	449.85	0.001[e]
SH4	Space Heater 4 (existing)	7.32	0.203	449.85	0.001[e]
SH5	Space Heater 5 (existing)	7.32	0.203	449.85	0.001[e]
SH6	Space Heater 6 (existing)	7.01	0.203	449.85	0.001[e]
SH7	Space Heater 7 (existing)	6.71	0.203	449.85	0.001[e]
SH8	Space Heater 8 (existing)	6.71	0.203	449.85	0.001[e]
OFFFURN	Office Furnace (existing)	7.32	0.127	449.85	0.001[e]
NHWB	New Hot Water Boiler (new)	6.55	0.254	533.15	0.001[e]
PRESWASH	Pressure Washer (existing)	1.07	0.001[d]	505.35	0.001[d]
BH1	Baghouse 1 (existing)	10.82	0.508	322.05	39.15
BH2	Baghouse 2 (existing)	10.82	0.508	322.05	39.15
BH3	Baghouse 3 (new)	13.72	1.524	322.05	19.40

[a] Meters
[b] Kelvin
[c] Meters per second
[d] Horizontal release point – exhaust plume's vertical momentum minimized
[e] Stack is equipped with a rain cap

3.4 Results for Ambient Impact Analyses

3.4.1 Full Impact Analyses

A significant contribution analysis was not submitted with this application. SCC performed a full impact analysis for criteria air pollutants that triggered modeling requirements for this permitting project.

The results of the full ambient impact analysis are listed in Table 9.

Table 9. RESULTS OF FULL IMPACT ANALYSES						
Pollutant	**Averaging Period**	**Modeled Design Concentration ($\mu g/m^3$)[a]**	**Background Concentration ($\mu g/m^3$)**	**Total Ambient Impact ($\mu g/m^3$)**	**NAAQS[b] ($\mu g/m^3$)**	**Percent of NAAQS**
PM_{10}[c]	24-hour	9.1[e] (7.5)[f]	94	103.1	150	68.7%
	Annual	3.2	30	33.2	50	66.4%
NO_2[d]	Annual	27.2	32	59.2	100	59.2%

[a] Micrograms per cubic meter
[b] National ambient air quality standards
[c] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[d] Nitrogen dioxide
[e] Highest 2nd high value
[f] Highest 6th high value for the modeling run using a concatenated 5-year meteorological data file

Compliance with the applicable NAAQS was demonstrated by SSC.

3.4.2 Toxic Air Pollutant Impact Analyses

Modeling for TAPs was required to demonstrate compliance with the TAP increments specified by IDAPA 58.01.01.585 and 586. The results of the TAPs analyses are listed in Table 10.

Table 10. RESULTS OF TAPs ANALYSES				
Toxic Air Pollutant	**Averaging Period**	**Maximum Modeled Concentration (ug/m^3)[a]**	**AAC/AACC[b] (ug/m^3)**	**Percent of AAC/AACC**
Arsenic	Annual	1E-05	2.3E-04	4.3%
Cadmium	Annual	4E-05	5.6E-04	7.1%
Formaldehyde	Annual	2.23E-03 (2.7E-03)[c]	7.7E-02	2.9% (3.5%)[c]
Thiram	24-hour	13.0	250	5.2%

[a.] Micrograms per cubic meter
[b] Acceptable ambient concentration for non-carcinogens/acceptable ambient concentration for carcinogens
[c] Maximum impact obtained from the modeling output file submitted by SSC and corresponding percentage of increment

TAPs impacts for this project were not predicted to be close to the allowable increments.

3.5 DEQ Sensitivity Analyses

DEQ re-ran the PM_{10} and NO_x modeling demonstration using all of the same modeling inputs presented by SSC, except for the exit velocities for Baghouses 1 and 2. DEQ used an assumed flow rate of 10 meters per second for each of these point sources. Emission rates were not altered.

Table 9. RESULTS OF DEQ SENSITIVITY ANALYSES		
Pollutant	**Averaging Period**	**Modeled Design Concentration ($\mu g/m^3$)[a]**
PM_{10}[b]	24-hour	7.74[d]
	Annual	3.54
NO_2[c]	Annual	31.66

[a] Micrograms per cubic meter
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[c] Nitrogen dioxide
[d] Highest 6th high value for modeling with a concatenated 5-year met data file

There was no significant increase in predicted ambient impacts due to the reduced exhaust velocities for the two existing baghouses. Additional validation of the exhaust velocities is not necessary.

4.0 CONCLUSIONS

The ambient air impact analysis submitted, in combination with DEQ's verification analyses, demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application, will not cause or significantly contribute to a violation of any air quality standard.